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The persistent gap: New Evidence on the Canadian Gender Wage Gap

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Statistics Canada
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ABSTRACT

This article uses data from the Survey of Labour and Income Dynamics (SLID) to investigate the extent to which factors not previously explored in the Canadian context account for wage differences between men and women. Like other studies using standard decomposition techniques and controlling for a variety of productivity-related characteristics, we find that men still enjoy a wage advantage over women: women's average hourly wage rate is about 84% - 89% of the men's average. Unlike other studies, controls for work experience and job-related responsibilities are used. Gender differences in full-year, full-time work experience explain at most, 12% of the gender wage gap. Gender differences in the opportunity to supervise and to perform certain tasks account for about 7% of the gender wage gap. Yet despite the long list of productivity related factors, a substantial portion of the gender wage gap cannot be explained.

Key words: gender earnings: women's wages:

I. Introduction

Recent generations have witnessed a profound change in the role of women in the labour market. The rate of female participation in the labour force doubled between 1961 (29%) and 1996 (60%).[1] Women workers in the 1990s have a stronger labour force attachment than their earlier cohorts: they are more likely to postpone childbearing until after they have secured their careers; have fewer children; are less likely to interrupt their careers for 6 months or more after childbirth[2] and return to work more quickly than new mothers of earlier generations (Gunderson 1998).

These changes in the labour force participation and the commitment of Canadian women have induced dramatic changes in the patterns of family earnings. The traditional concept of male 'breadwinner' and female 'caregiver' no longer symbolizes the Canadian family. Single earner families with only the husband doing paid work changed from the norm in 1967 (58%) to the exception (18%) by 1994 (Gunderson, 1998). Women's earnings are an increasingly important component of family earnings. In dual earner families, about one quarter of Canadian women earn more than their male partner (Crompton and Geran, 1995).

Along with these changes, it is a well-documented fact that Canadian women have made substantial gains in their wage-determining or productivity-related characteristics over the past two decades. There has been considerable improvement in women's relative (to men) skills level, in women's quantity of schooling, in women's job experience, and in women's successful infiltration into male-dominated occupations.

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[1] Data from the Census of Canada in Gunderson, 1998 p.24-26.

[2] Almost 9 in every 10 working women who gave birth in either 1993 or 1994 were back on the job within a year. These women took an average of 6.4 months off work. *Perspectives on Labour and Income*, Statistics Canada, Autumn 1999, Catalogue number 75-0001-XPE).

Yet despite these pervasive and permanent shifts in female labour force participation, commitment and their relative improvements in wage-determining characteristics, pay differences between men and women persist and continue to be a topical issue in the 1990s. For the past 30 years, the Survey of Consumer Finances (SCF) has documented these pay differences. Among full-year, full-time workers, the female to male earnings ratio was 72.5% in 1997, up from 58.4% in 1967.[3]

Standard decomposition techniques split the gender wage gap into an 'explained' portion (attributable to differences in labour market qualifications and job characteristics) and and 'unexplained' portion (attributable to differences in the pay men and women receive for the same characteristic). Most economists focus on gender differences in skills to explain the gender earnings gap.(Coish & Hale, 1995; Christofides & Swidinsky, 1994; Gunderson 1998; Wannell, 1990; Baker, Benjamin, Desaulniers, Grant 1995).

The goal of this paper is twofold. The first objective of this paper is to facilitate the move from estimates of gender earnings ratios produced by the Survey of Consumer Finances to estimates of gender wage ratios produced by the Survey of Labour and Income Dynamics. This paper briefly examines the gender pay ratio based on annual earnings – known as the **gender earnings gap** - using similar definitions and concepts used in the publication of female-male earnings ratios based on SCF data. The paper focuses on the gender pay gap based on hourly wage rates – known as the **gender wage gap**. The second objective of this paper is to take advantage of the wealth of information gathered by the Survey of Labour and Income Dynamics (SLID) by focussing on factors not previously explored in the Canadian context to explain the gender earnings differential. This may add a substantial dimension to research in the area of women's labour market issues and in the analysis of the gender wage gap.

[3] Data from the Survey of Consumer Finances, *The Earnings of Men and Women*, Statistics Canada, 1997 Catalogue no. 13-217-XIB.

The plan of the paper is the following. Section II provides a brief literature review of the Canadian evidence on the gender wage gap over the past two decades. Section III documents the two measures of earnings used in this study. Section IV specifies the samples used in the study. Section V discusses SLID variables that may explain part of the gender differentials. Section VI examines the gender wage gap and the gender earnings gap. Section VII examines the determinants of wages by gender. Section VIII decomposes the gender wage gap into a portion attributable to gender-specific factors and a portion attributable to differences in the pay men and women receive. A discussion of the results is presented in Section IX. Concluding remarks follow.

II. Literature Review

There are numerous Canadian studies estimating the gender wage differential. Although there are significant differences among the studies related to data sources and methodology, there are certain consistent findings. Table 1 highlights some of the main findings of the Canadian literature.[4]

The first unequivocal fact is that the *gender earnings differential has declined over time*. Using Census data, Baker et al. (1995) find that the full-year full-time female to male yearly earnings ratio increased steadily from 0.60 in 1970 to 0.64 in 1980 to 0.67 in 1990. This finding is also obtained by Gunderson (1998) who, also using Census data, calculates a similar yearly earnings ratio of 0.62 in 1970, 0.67 in 1980 and 0.71 in 1990 for full-year, full-time workers. Applying a consistent framework to data from the Survey of Consumer Finances (SCF), Baker et al. (1995) find a comparable female to male yearly earnings ratio of 0.64

[4] This list is meant to provide recent Canadian evidence on the gender wage gap and its respective components. It is not meant to be exhaustive of the literature.

in 1986 and 0.67 in 1991.[5] Coish and Hale (1995) use data from the 1993 Survey of Labour and Income Dynamics (SLID) and find that women employed full-year full-time earn roughly 79% of the earnings of equivalent males. Interestingly, their calculation of the gender differential in hourly wag rates using all workers (full-time and part-time workers) produces a marginally lower ratio of 0.78. Christofides and Swidinsky (1994) encounter a white female-white male earnings ratio of 0.76 using hourly wage rates from the 1989 Labour Market Activity Survey.

Second, *a substantial portion of the male-female pay gap cannot be explained by gender differences in observable wage-determining characteristics*, that is the gap cannot be explained by the difference in the average value of the wage-determining characteristic $(\overline{X}_m - \overline{X}_f)$, evaluated according to the male returns β_m. Baker et al. (1995) find that roughly one quarter of the gender earnings gap in the 1970–1985 period was explained by differences in wage-related characteristics. Gunderson (1998) detects a slight decline in the portion of the gender earnings gap attributable to differences in the wage-determining characteristics: from 35.5% in 1970 to 29.5% in 1990. He concludes that this finding 'suggests that the female work force has become more like the male workforce in its wage determining characteristics and this has helped to narrow the overall earnings gap' (Gunderson, 1998). Christofides and Swidinsky's (1994) estimated share of the gender wage differential attributable to productivity-related factors is 26.5% - falling between the Baker et al. (1995) and the Gunderson (1998) estimates. Coish and Hale (1995) find only 12% of the wage gap explained by demographic or human capital characteristics.

Third, *most of the improvement in Canadian women's relative pay was accomplished by a decline in the 'unexplained' portion of the gender pay gap.*

[5] Baker et al. (1995) hypothesize that the differences in the Census and the SCF earnings ratio may result from differences in sampling techniques, in the timing of the surveys, and in sample selection exclusions.

The 'unexplained' component of the wage gap refers to the differences in the pay men and women receive for the same characteristics. Oftentimes, this 'unexplained' component is referred to as an estimate of the gender based labour market discrimination. Baker et al. (1995) decompose the change in gender earnings gap between two periods (t-1) and (t) $(\bar{y}_t^m - \bar{y}_{t-1}^m) - (\bar{y}_t^f - \bar{y}_{t-1}^f)$ into a portion attributable to changes in the mean characteristics $\left[\hat{\beta}_t^m(\bar{X}_t^m - \bar{X}_{t-1}^m) - \hat{\beta}_f(\bar{X}_t^f - \bar{X}_{t-1}^f)\right]$ and to changes in the returns to those characteristics $\left[\bar{X}_{t-1}^m(\hat{\beta}_t^m - \hat{\beta}_{t-1}^m) - \bar{X}_{t-1}^f(\hat{\beta}_t^f - \hat{\beta}_{t-1}^f\right]$ over the period using the following expression:

$$(\bar{y}_t^m - \bar{y}_{t-1}^m) - (\bar{y}_t^f - \bar{y}_{t-1}^f) = \left[\hat{\beta}_t^m(\bar{X}_t^m - \bar{X}_{t-1}^m) - \hat{\beta}_f(\bar{X}_t^f - \bar{X}_{t-1}^f)\right] + \left[\bar{X}_{t-1}^m(\hat{\beta}_t^m - \hat{\beta}_{t-1}^m) - \bar{X}_{t-1}^f(\hat{\beta}_t^f - \hat{\beta}_{t-1}^f\right]$$

They find that between 1970 and 1980 most of the decline in the gap is due to a decline in the relative returns to wage-determining factors; between 1980 and 1985 most of the decline in the gap is due to changes in the relative characteristics of men and women; and finally between 1985 and 1990, the decline in the difference in returns is important.[6]

The literature puts forth several common explanations for the decline in the 'unexplained' component. The first explanation is a widespread decline in discrimination towards women in the labour market. This may take the form of changing societal and/or employer attitudes towards women at work. Employers are constantly making decisions with imperfect information and may use gender to predict future work commitment. Some firms may hesitate to hire women because women have, on average, more career interruptions and more absences due to family reasons than men Consequently, statistical discrimination against

[6] Baker et al. (1995) find that 50% - 114% of the decline in the gap between 1970 and 1980 is due to the difference in returns; 65% - 88% of the decline in the gap between 1980 and 1985 is due to differences in characteristics; 62% - 85% of the decline in the gap between 1985 and 1990 is due to differences in returns. These numbers are taken from Baker et al. Table 2.

the individual woman may result. This would be especially true in firms with substantial hiring and/or training costs and where wages are generally higher. Insofar as the increase in women's attachment to the labour force induces changes in employer behaviour, women's access to high-paying jobs will improve due to decreases in statistical discrimination.

The second explanation for the decline in the 'unexplained' component is related to differences in unmeasured attributes, skills or preferences. Most data sets do not contain sufficient information on other important determinants of the gender pay gap. The Survey of Labour and Income Dynamics offers a number of variables not gathered by other data sources that may be considered important determinants of the gender pay gap. Section III examines these variables and justifies their inclusion.

If there were no unexplained component to the gender wage gap, that is, if there were no differences in the pay men and women receive for the same characteristics, females would still earn less than men but only slightly (Table 1, Column 7). The earnings ratio net of differences in the returns to the same characteristics would range from about 85% in 1970 from the Gunderson (1998) to around 90% for the entire 1970-1990 period using the numbers from Baker et al. (1995) and 93% using Christofides and Swidinsky (1994). Again, the exception is the Coish and Hale study that estimates the earnings ratio without the unexplained component to be 97%.[7]

Finally, *estimates of the gender pay gap are sensitive to the earnings measure used, to the choice of method, to the population selected, and in the specification*

[7] If men and women received the same pay for similar characteristics, the entire gender earnings gap would be attributable to differences in productivity-related factors. In other words, we compare the wage men earn ($\overline{W}_m = \overline{X}_m \hat{\beta}_m$) to the hypothetical wage women would receive if they were paid according to the male wage structure given their own characteristics ($\overline{W}_f^* = \overline{X}_f \hat{\beta}_m$).

thus rendering comparisons difficult. Baker et al. (1995) observe that the female-male earnings ratio after controlling for differences in observable characteristics hovers around 70%.[8] On the other hand, Gunderson (1998) notices that the ratio increases from 74% in 1970 to 80% in 1990. Christofides and Swidinsky (1994) and Coish and Hale (1995) produce gender wage ratios after controlling for differences in observable characteristics closer to that of Gunderson (1998): roughly 82% in 1989 and 80% in 1993 respectively. The different studies also produce somewhat different estimates of the 'unexplained' earnings differential throughout the 1970-1990 period (Table 1, Column 6).

III. Two measures of earnings: annual earnings and hourly wage rates

Up until 1997, Statistics Canada published female-male earnings ratios using data from the Survey of Consumer Finances (SCF). Among full-year, full-time workers[9] the female-male **annual earnings** ratios ranged from 58.4% in 1967 to 72.5% in 1997. Among all persons receiving a wage, a salary or net income from self-employment, the female-male earnings ratio ranged from 46.1% in 1967 to 63.8% in 1997 (Table 2).

The size of the gender gap reported by the SCF may be contaminated by differences in the number of hours worked per week among full-year, full-time (FYFT) male workers and FYFT female workers. The SCF definition of a FYFT worker is a person who works 30 hours or more per week for 49-52 weeks in the reference year. But there is considerable variation in the number of hours usually worked per week among full-time workers - using data from the Labour Force Survey, men employed full-time in December 1996 usually worked 43.6 hours per week while women employed full-time usually worked 39.6 hours per week.

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[8] To calculate the female-male earnings ratio after controlling for differences in characteristics, ratio = $\exp\left[-(\beta_m - \beta_f)\bar{X}_f\right]$

[9] The SCF definition of a full-year full-time worker is a person who works 30 hours or more per week for 49-52 weeks in the reference year.

Using the National Graduates Survey. Wannell and Caron (1994) find that among recent graduates, full-time female workers worked an average of 2.5 – 4 hours less per week than their male counterparts. Adding weekly hours to their wage equation, Wannell and Caron (1994) demonstrate that the **wage gap** among graduates is smaller than the **earnings gap**.

The definition of annual earnings may render the size of the gender pay gap difficult to interpret. The earnings ratios based on the SCF data define total earnings as consisting of wages and salaries and/or net income from self-employment from all sources. With this definition of earnings, it is difficult to pinpoint the source of the gender gap in annual earnings. Is the gender gap in annual earnings the result of differences in the base pay men and women receive for a given job? Or in net income from self-employment? Or in the premiums associated with over-time work? Or in multiple jobs held?

Hourly wage rates are a superior measure to annual earnings when determining the gender pay gap for several reasons. First as noted earlier, when annual earnings measures are used, the researcher is forced to restrict attention to full-year full-time workers to avoid *some* of the of problems associated with the number of hours worked per week and the number of weeks worked per year. Hourly wage rates avoid this problem altogether. Second, using hourly wage rates allows the researcher to determine differences in the pay men and women receive for similar jobs – that is, to accurately control for job characteristics such as tenure, industry, occupation or union status. This cannot be done precisely when using total annual earnings. Because total annual earnings are the summation of wages and salaries from *all jobs* in the reference year, it becomes difficult to examine the impact of particular job characteristics. The best that can be done when using total annual earnings is to use job information on the 'main' job and to define main job as the job with the greatest number of work hours or the job accounting for the greatest share of earnings.

IV. The Data and Sample

We use the 1997 data from the Survey of Labour and Income Dynamics (SLID) to extract two samples – the first sample analyzes the **gender wage gap**, and the second sample analyzes the **gender earnings gap**.

The analysis of the **gender wage gap** consists of paid workers, aged 18-64 and who are not enrolled as full-time students in the reference year. Self employed individuals, individuals for whom hourly wage data or earnings data is not known, individuals for whom the full-year full-time work experience equivalent[10] (FTFYE) is not known and individuals for whom total usual hours worked in the job during the year is not known[11] are excluded. The analysis is based on 28,741 jobs – 14,839 jobs held by men and 13,902 jobs held by women. This sample is used for both cross-tabulations and for the multivariate analysis of the gender wage gap.

The second sample is selected for cross-tabulations of the **gender earnings gap** and imposes the additional restrictions of workers employed full-year (53 weeks per year) full-time (130 hours or more each month). This sample consists of 15,687 individuals – 9,020 men and 6,667 women. For workers holding more than one job during the reference year, the job characteristics attributable to the main job (where the main job is defined as the job with the greatest number of usual hours worked during the reference year) are used for the analysis.

[10] The exclusion of observations with unknown full-year, full-time work equivalent is not believed to produce any sample selection bias. These exclusions were, to a fair extent, randomly distributed throughout the population.

[11] Since all jobs held during the reference year are included in the analysis, the cross-sectional job weights were standardized according to the annual hours worked in the job. This is done to avoid over-representing short tenure jobs.

V. Gender differences in explanatory variables

Work experience

Past research on gender pay differentials have suffered from serious data limitations. Oftentimes age or age minus schooling minus 6 is used as a proxy for the acquisition of general human capital skills or as a proxy for potential work experience. This is problematic since these measures tend to overstate the *actual* experience of women. That is, no account is taken of interruptions in the labour force participation of women for child-rearing purposes (i.e. complete withdrawals from the labour market) or of any restrictions on the hours of work per week or on the number of weeks worked per year.

SLID offers a measure of *actual* labour market experience - the full-year full-time equivalent (FYFTE). This measure incorporates *all work experience* by including information on the number of hours worked per week (i.e. full-time or part-time job) and for the number of weeks worked per year (full-year or part-year) for all jobs held by the individual.[12]

The SLID measure of FYFTE work experience is a good estimate of the actual labour market experience of workers since it incorporates all work - but it is far from perfect. Although, as we will see, it 'explains' a sizable portion of the gender pay gap, there are two important drawbacks to this measure.

First, information on the *continuity* of work experience, on the *duration* of labour force withdrawals, on the *frequency* of withdrawal and on the *timing* of a withdrawal is missing.

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[12] The SLID measure is calculated as follows:
FYFTE experience= number of years worked full-year, full time + 0.5 * (number of years worked part-year, full-time) + 0.5 * (number of years worked full-year, part-time) + 0.25*(number of years worked part-year, part-time).

It is a well-documented fact that men and women differ considerably in the amount of time they work and in the continuity of their work experience. Women are more likely to combine periods of paid work with periods of labour force withdrawal for family-related reasons. According to Corcoran and Wood (1979), this may influence the pay women receive in several ways. First, since women are less likely to work continuously than men, they may have lower levels of job tenure– a factor that influence wages. Second, human capital skills may depreciate during long periods of labour force withdrawals. As a result, women returning to the same employer after an interruption in employment may be less likely to be promoted, and those women not returning to the same employer may be forced to accept wages that are lower than the wages they received prior to their withdrawal. Third, women expecting several withdrawals from the labour force may postpone training, or may decide to accept low-wage jobs in industries or occupations that are easy to enter and that have little or no penalty for exiting. Fourth, the *timing* of labour force withdrawals may impact wages. The acquisition of job-related skills is usually concentrated at the start of careers – which generally coincides with decisions regarding children. Murphy and Welch (1990) find that a significant portion of real lifetime earnings growth occurs during the first years after graduation. If this is the case, then the timing of labour force withdrawals may have important long run implications for future earnings patterns / lifetime earnings among men and women.

Table 3 illustrates the differences in work experience that men and women bring to the labour market. Compared to men, the average woman has 3.9 years less FYFTE work experience and has 1.3 fewer years of present employer tenure. Alternatively, men spend a greater proportion of their potential years of work experience working full-time than women (94% versus 75%).

Second, the definition of full-year and full-time used for the calculation of FYFTE work experience, may be problematic. Full-year refers to working at least 6 months and full-time refers to working at least 30 hours per week in a calendar

year. As noted earlier, there is considerable variation in the number of hours usually worked per week among full-time workers. For instance, person A works 45 hours per week for 12 months while person B works 32 hours per week for 7 months. Under the SLID measure of FYFTE, each person would have 1 year of FYFTE experience despite the significant variation in their work experience.

Job-related responsibilities

SLID contains information on work responsibilities such as supervisory positions and work-related tasks such as workers' influence on budgeting or staffing, pay and promotion, and deciding work for others. As long as there exists differences in the opportunities for obtaining supervisory positions and/or that there exists differences in the wage premiums offered to men and women in these jobs, gender wage differentials will exist.

Table 4 shows how men and women experience different opportunities in their job-related responsibilities. Compared to the jobs men hold, women are less likely to be employed in jobs having supervisory responsibilities (35.2% and 24.8% respectively) and are less likely to be employed in jobs that involve budget and/or staffing decisions (21.7% and 15.7%).

Educational attainment

One advantage of SLID is information on the major field of study category for the highest completed level of post secondary education. Table 5 shows the diverging percentage distributions[13] and the gender composition[14] of each major field of study. Not surprisingly, many fields of study are dominated by either men or women and this may impact the gender pay gap. For instance, graduates of

[13] The percentage distribution shows how the male and female workforces are split across different major fields of study.

[14] The gender composition shows the incidence of men and women in each field of study.

engineering, applied sciences technologies and trades fields are mostly men while on the other hand, women are over-represented among college graduates with a commerce or business administration degree, and among health and education fields. Since wages differ by field of study, the choice of major field of study by men and women may account for some of the gender pay gap.

Other explanatory variables

This paper incorporates several explanatory variables other than gender (and those mentioned previously) that are generally considered to influence wages. Marital status and age of youngest family member is meant to account for differences in household responsibilities and in the division of labour within the home. Region and urban size class is designed to capture inter-regional wage differentials. Since large firms pay more than small firms (Morissette, 1991) and since women have a lower probability of working in large firms, firm size is included as a potential explanation of the gender wage gap. Finally, union status attempts to account for differences in wage structures between non-unionized and unionized sectors.

VI. The mean gender differentials:

Table 6 highlights the gender differences in hourly wages (also referred to as the gender pay gap) and in the annual earnings (alternatively, referred to as the gender earnings ratio) by a number of demographic and labour market characteristics while Table 7 examines the gap by job characteristics.

A. Gender wage gap: Hourly wage rates

In 1997, women workers earned on average $15.12 per hour while male workers received $18.84 per hour. In other words, women earned about 80% of the average male hourly wage (Table 6, Panel 1).

The ratio of female-to-male hourly wage rates is highest (that is, the pay gap is smallest) -among young workers (Table 6). Young females aged 18-24 (25-34) earn about 85% (86%) of comparable male earnings. The small pay gap between young men and young women may be attributable to the fact that these workers are new entrants into the labour market with similar skills and similar labour market experience. As well, the effect of career interruptions, job advancement and differentiated household responsibilities have not yet taken place. There are greater differences in FYFTE work experience as workers age: men aged 45-54 (55-64) have 6.4 (13.1) more years of FYFTE work experience than comparable women. This may explain why the gender pay ratio falls steadily with age – women aged 45-54 earn about 75% of the average hourly wage rate of men 45-54. Another possibility is that gender differences in educational attainment may be larger among older cohorts of workers than among younger ones. Older cohorts of women may also have a higher concentration in low-paid occupations than younger cohorts of women.

The gender pay gap is smallest amongst single, never married men and women (96%) and highest among married men and women (77%) (Table 6). The smaller pay gap between single, never married men and women may be partly related to age as well as to the fact that they have similar commitments to the labour force and to household responsibilities. The large pay gap between married men and married women may be partially explained by the conflict married women face between their family and their career. The hours worked by married women are more likely to be part-time than the hours worked by married men.[15] Part-time work may allow women to choose jobs that are closer to home or that coincide with their children's school hours. As long as there is a premium associated with full-time work, women who choose to work part time to balance family and work responsibilities are willing to accept lower wages in exchange for flexible or

[15] About 15.4% of hours worked by married women are part-time compared to 2.1% of hours worked by married men.

shorter work hours. These reasons may partially explain the higher gender wage gap among married women and married men.

As noted earlier, one advantage of the SLID data set is the information on actual work experience as measured by the full-year, full-time equivalent (FYFTE) variable. At low levels of work experience, the gender pay gap is small: women with 0-2 years of work experience earn 96% of the average male hourly wage rate with a similar level of work experience (Table 6). But, interestingly, the gender pay gap gets larger as the number of FYFTE work experience gets larger. This mirrors the findings of Finnie and Wannell (1999). Using a sample of recent post secondary graduates from the National Graduates Survey, they find that the gender pay gap is relatively small two years after graduation (93%) but widens 2 – 5 years after graduation (84%).[16]

The fact that the gender wage gap increases as FYFTE increases may be attributable to several factors. First, women are more likely to span their work experience over a longer period of time than men – women with 10-19 years of FYFTE work experience are, on average, 4 years older that men with similar levels of FYFTE experience. Second, the longer the actual work experience, the greater the possibility that women had frequent interruptions, long withdrawals from the labour force and shorter job tenure – factors that influence wages and may increase the gender wage gap. Finally, part of the difference may also be due to the fact that workers with high levels of FYFTE work experience are generally older, which, for reasons mentioned above, leads to higher wage gaps.

The gender pay gap differs among education levels (Table 5). Compared to the entire population, the gender pay gap is lowest among university graduates - women earn roughly 85% of the average hourly wage rate of university educated

[16] Using data from the National Graduate Survey, Finnie and Wannell (1999) find that for 1990 graduates, the gender wage gap is 93% in 1992 and 84% in 1995. They conclude that "these findings have interesting implications for the longer term earnings profiles of graduates as they suggest that longer run (permanent) reductions in the earnings gap amongst cohorts of graduates might not be nearly as great as immediate post-graduation record suggest."

men. This is not surprising since men and women in this population have similar endowments of wage-determining skills and similar levels of commitment to the labour market. However, this is a partial explanation since the gender wage gap is 81% among persons with a university degree higher than a bachelors.[17]

The type of tasks performed and the work responsibilities of male and female workers may also influence the gender pay gap (Table 4). As noted earlier, men are more likely to hold supervisory positions and among supervisors, male supervisors are more likely to have the added responsibilities of influencing pay/promotion and of deciding work for others. This may partially explain why male supervisors enjoy a higher hourly wage rate than female supervisors.

The gender wage gap is smaller among unionized workers than non-unionized workers: unionized (non-unionized) women workers earn 87% (77%) of the average unionized (non-unionized) male worker (Table 7).[18] It is a well documented fact that unions tend to compress the wage structure by reducing wage differentials among workers with different characteristics and by standardizing the wages of similar workers across establishments in the same industries or occupations (Meng, 1990). Unions typically increase the wages of those at the lower end of the pay scale proportionately more than those at the upper end (Gunderson and Riddell, (1993)).

The gender pay gap does not decline as job tenure in the *current* job increases (Table 7). That is, the ratio is not higher for high levels of accumulated experience at the current job. This is surprising since one would expect convergence of wages as tenure increases. Thus, the impact of job tenure may be confounding the influence of other important variables such as industry, occupation, age or labour market experience.

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[17] This may be attributable to the concentration of women in degree programs in lower paying fields.

[18] A unionized worker refers to workers covered by a collective bargaining agreement or a union member.

Women who work part-time earn 92% of the average male part-time hourly wage rate (Table 7). But the aggregated gender pay gap hides interesting heterogeneity among part-time workers. Examining the gender distributions in part-time work hours by industry and occupation reveals that for men, part-time work hours are concentrated in the low-wage consumer services industry (36%) and in service occupations (24%). For women, part-time work hours are concentrated in the consumer services industry (33%), low-wage clerical occupations (27%) and in the relatively high-wage natural or social science occupations (29%). This finding casts doubt on such explanations of the small overall gender pay gap among part-time workers as owing mainly to the fact that these workers possess little skills and are clustered in low-wage industries and occupations. Rather, the relatively small part-time gender wage gap may be partially due to the relatively high earnings of a subset of part-time female workers.

B. Gender earnings gap: Annual Earnings

In 1997, the average full-year, full-time female worker earned $31,506 per year while the average FYFT male worker received $46,108. In other words, the average women worker earned about 68% of the average male annual earnings (Table 6, Panel 2). As pointed out before, gender pay gap analyses based on annual earnings measures suffer from serious data problems associated with assumptions on the number of work hours per week.

Despite the problems of using annual earnings, all previous relationships between the gender wage gap and selected measures are maintained for the gender earnings gap. Namely, the gender earnings gap is smaller among younger, better-educated, single never married, unionized workers, public sector workers and workers with low levels of FYFT work experience.

VII. The Determinants of Wages By Sex

There is no 'universally accepted' set of conditioning variables that should be included in a wage equation. Most economists control for productivity-related factors, such as education and work experience, when assessing the gender earnings differentials. Education is considered a productivity enhancing investment designed to improve earnings. Job tenure with present employer is considered a measure of job-specific training - employers investing in their employees are likely to pay a higher wage than the market wage in order to reduce turnover.

Some economists argue that control variables such as occupation and industry should be included. Yet control variables such as occupation and industry, may themselves be the result of discrimination and may lead to an 'over-justification' of pay differentials. (Wannell, 1989) In other words, the overcrowding of females into relatively low-wage occupations does explain part of the earnings gap.

Unlike other studies, our models are fully-interacted with gender.[19] Our analysis follows that of other studies and begins with a 'standard' wage equation that includes traditional human capital variables such FYFTE work experience, education level and major field of study, job tenure, marital status and age of youngest family member. In a second specification, controls for part-time status, union status, region, geographical size, and firm size are added. Work responsibilities are included in specification 3. In specification 4, we estimate a

[19] In most studies of the gender earnings differential, wage equations for men and women are run separately. In this study, a fully interacted regression equation is run. That is, we run one equation with a complete set of female interaction terms. This method has two main advantages over running two separate equations. First, the individual regressions for men and women can be easily deduced from the single equation (Appendix 1). Second, we can use the single regression to test a variety of hypotheses. For instance, we can test whether the female differential intercept / slope is statistically significant – this pinpoints the source(s) of the difference. The t test can tell us, for example, if the returns to a university education is the same for men and women but we can also use the F test to determine if the female returns to the set of education variables is significant (Appendix 2, Table 1).

model that includes controls occupation and industry.[20] The results may be summarized as follows.

First, in all specifications, the differential intercept term for women is significantly less than that of men. In other words, there exists large, significant differences in the earnings of men and women that are unrelated to the choice of explanatory variables in this study.

Second, *the relationship between the various independent variables and wages are consistent across gender.* Results not shown here indicate that the wages of men and women increase monotonically with FYFTE work experience, education level[21] and job tenure. Wage levels are also higher in unionized jobs, in large (500+) firms, among full-time workers and in jobs with greater responsibilities.

Third, after controlling for a variety of productivity-related characteristics, the returns to each additional year of FYFTE work experience is similar for men and women. That is, for each additional year of FYFTE work experience, the hourly wage rates of men (women) increase about 0.7% (0.8%).[22]

There also appears to be a significant gender difference in the returns to work responsibilities after controlling for a number of other factors. Male (female)

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[20] Appendix 2 Table 1 shows the results from a variety of hypothesis tests on the female differential intercept and slope coefficients. In Specifications 1 – 3, the female returns on all sets of coefficients differed significantly (at the 5% level) from the returns of men. In Specification 4, the female returns to FYFTE experience, union status, tenure and job duties were not statistically different (at the 5% level) from those of men. The model was re-estimated omitting those female differential terms.

[21] The only exception is in specification 4 where male high school graduates earn slightly more than males who have some post secondary education.

[22] A simple t test on the female differential FYFTE experience coefficient shows that, for at least 3 out of 4 specifications, the female return for each additional year of FYFTE work experience is significantly (at the 5% level) higher than for men but there appears to be no empirical difference. When controls for industry and occupation are added (Specification 4), there is no significant difference in the returns men and women receive for each additional year of FYFTE experience (Appendix 2, Table 1).

workers who influence budget and staffing decisions earn about 4.9% - 7.6% (7.8 – 11%) more than those who do not participate in the decision making.[23] As well, male (female) supervisors that influence the pay and promotion of their staff or decide work for others earn 6% - 9% (5% - 6%) more than comparable workers not in supervisory positions and earn 3% more than supervisors that do not perform these tasks.[24] Male and female supervisors that perform both duties earn 11-13% more than comparable workers not in supervisory positions and earn roughly 8% more than supervisors that do not perform these tasks.

Fourth, the returns women receive to education level, major field of study, tenure, marital status, age of youngest family member, part-time status, union status, firm size, industry and occupation differ significantly from those of men. Appendix 2 Table 2 summarizes which characteristics yield significantly different returns between men and women. The positive interactions show the attributes for which women are compensated relatively better than men while the negative interactions illustrate the characteristics that women are rewarded relatively less than men On the one hand, female returns are significantly higher than those for men at each level of present employer tenure, for part-time status, in small firms, and in Toronto or Vancouver. An examination of differences in the returns to each major field of study shows that women receive significantly higher returns to college level health science and technology; and to university studies in educational, recreational services, humanities and related fields, and social science field. On the other hand, married women and women with less than a high school education fare relatively worse than similar men.

[23] The t test on the budget and staffing decision variable in both specifications 3 and 4, shows that there is a significant difference in the returns of men and women at the 5% level of significance (Appendix 2, Table 1).

[24] In specifications 3 and 4 that incorporate work responsibilities a joint test of significance was conducted on the set of differential slope coefficients for women related to work responsibilities. In specification 3, the F test concluded that the female returns to work responsibilities differed significantly from those of men at the 5% level. However, in Specification 4, the F test concluded that the female returns to work responsibilities were not significantly different from those of men. (Appendix 2, Table 1).

VIII. Accounting for the gender wage gap

Although men and women differ in ways that may affect their productivity, it does not necessarily mean that these differences 'explain' the gender pay gap. The pay gap can only be explained if the differences in the factors in question are themselves important determinants of the pay men and women receive. The wage gap between men and women may be the result of either differences in their productivity-related characteristics (Section V) or differences in the compensations they receive for the same productivity-related characteristics (Section VII). The unadjusted gender gaps discussed in Section VI do not control for differences in the composition of the male and female workforce and in their wage-determining characteristics. In this section, multivariate analysis techniques are employed to control for the effect of several factors simultaneously.

The dependent variable is the natural logarithm of hourly wage rates. Each coefficient is the percentage change in hourly wage rates associated with a one-unit change in the explanatory variable. Table 8 presents the decomposition of the mean hourly wage differential into an 'explained' portion and an 'unexplained' portion for several different specifications. Table 9 shows the fraction of the gender wage gap attributable to various factors. The technical details of the decomposition method employed in this study are outlined in Appendix 1 while Appendix 2 Table 1,2 presents the results of various hypothesis tests.

Each subsequent specification includes additional variables in an attempt to explain of the gender wage gap. Several interesting findings are highlighted.

First, after *accounting for differences in a variety of observable characteristics, women's average hourly wage rate is about 84% - 89% of the men's average (Table 8, Column 4).* Some researchers argue that occupational segregation is a mechanism whereby wage discrimination may occur and that the inclusion of industry and occupation variables may *underestimate* the degree of wage

discrimination. Table 8 shows that the adjusted wage differential is 89.4% when controls for occupation and industry are included (Specification 4) compared to 86.9% when these controls are omitted (Specification 3).

Second, *despite the long list of productivity related factors, roughly one half to three-quarters of the gender wage gap cannot be explained* (Table 9). This finding mirrors the results of other Canadian studies namely, Baker et al. (1995), Gunderson (1998), Christofides and Swidinsky (1994) and Coish and Hale (1995). This is an interesting finding given that in previous sections it is documented that men and women receive similar returns for a wide range of characteristics. The fact that there are large, unexplained wage differences may be related to the fact that there are large differences in productivity-related factors or skill measures that are not captured by our data set.

Third, *differences in the work experience between men and women account for a considerable portion of the wage gap.* Gender differences in FYFTE work experience account for, at most, 12% of the wage gap. Differences in job tenure explain 3%-5% of the gender wage gap and differences in part-time status justify 4% - 9% of the gender wage gap (Table 9).

Fourth, *gender differences in major field of study account for at most, 6% of the gender wage gap but there is considerable variation in the contribution of each major field of study to the gender wage gap (Table 9).* About 17%[25] of the wage gap can be explained by the fact that men are more likely to graduate from engineering and applied sciences programs and that these degree programs yield high returns. However, the prevalence of women graduating from health science programs and educated related fields and the relative high earnings associated with these programs reduces the explained component by 8%.

[25] Using controls for FYFTE work experience, major field of study, job tenure, marital status, age of youngest family member, union, part-time, region, CMA / urban size firm size and job duties (specification 3), the contribution of each major field of study to the gender wage gap is calculated.

Fifth, *gender differences in the opportunity for obtaining supervisory positions and in the performance of certain tasks justifies part of the gender wage gap.* Gender differences in supervisory responsibilities and performing related job duties such as deciding work for others and influencing pay and promotion explains, at most, 5% of the gender wage gap. Work responsibilities such as influencing budget and staffing explains almost 2% of the gender wage gap (Table 9).

Finally, *other wage determining factors have a role in explaining the gender wage gap.* The fact that women are clustered into low-wage occupations and industries explains part of the gender wage gap. Differences in occupation and industry explain 9% and 11% of the wage gap between men and women (Table 9, Specification 4). Gender differences in union density account for just 0.9% of the gap. Firm size has a negligible impact on the gender wage gap: roughly 1% of the gap can be explained by gender differences in firm size.

IX. Discussion

This paper has attempted to shed new light on an old issue – that of gender wage differentials. One explanation of these wage gaps stresses the difference in wage-determining characteristics. However, attempts to account for the wage differences with productivity-related factors still leave men at a considerable wage advantage. Yet it should be noted that some of the differences in productivity related factors themselves many reflect discrimination or inequality of opportunity.

Many economists have questioned whether the measures traditionally used in the study of gender wage differentials capture all the productivity-related factors that influence earnings. The fact that men have a wage advantage still leaves many questions unanswered. Namely, are there influences outside the labour market that affect the acquisition of skills? Do we have appropriate data, that is, are we doing

a good job at measuring wage-determining skills? Like many other data sets. SLID does not contain information on self-imposed restrictions on work hours or locations. As well, information on the duration of labour force withdrawals, on the frequency of withdrawals, or on the timing of labour force withdrawals would be a welcome addition to the study of gender wage differentials.

X. Conclusions

This article uses data from the Survey of Labour and Income Dynamics (SLID) to investigate the extent to which factors not previously explored in the Canadian context account for wage differences between men and women. Like other studies using standard decomposition techniques, we find that men still enjoy a wage advantage over women: women's average hourly wage rate is about 84-89% of the men's average. Unlike other studies, controls for work history and job-related responsibilities are used. Gender differences in full-year, full-time work experience explain a substantial proportion of the gender wage gap – roughly 12%. Gender differences in the opportunity to supervise and to perform certain tasks account for about 5% of the gender wage gap. Yet despite the long list of productivity related factors, roughly one half to three-quarters of the gender wage gap cannot be explained.

References

Baker, Michael, Dwayne Benjamin, Andrée Desaulniers and Mary Grant (1995). 'The distribution of the male/female earnings differential, 1970-1990.' *Canadian Journal of Economics*, vol. 28, no. 3, p.479-500.

Blau, Francine and Marianne Ferber (1986). *The Economics of Women, Men and Work*. (Englewood Cliffs, N.J.: Prentice-Hall).

Christofides, L. and R. Swidinsky (1994). 'Wage Determination by Gender and Visible Minority Status: Evidence from the 1989 LMAS.' *Canadian Public Policy*, vol. 20, no. 1, p.34-51.

Corcoran, Mary and Greg Duncan (1979). 'Work History, Labour Force Attachment and Earnings Differences Between the Races and the Sexes.' *Journal of Human Resources*, 14, no. 1, p 3 – 20.

Cromption, Susan and Leslie Geran (1995). 'Women as main wage earners'. *Perspectives on Labour and Income*, Statistics Canada. Catalogue no. 75-001E. Winter 26-29.

Doiron, D. and C. Riddell (1994). 'The Impact of Unionization on Male-Female Earnings Differences in Canada', *Journal of Human Resources*, V.29, no. 2 p. 504-35.

The Earnings of Men and Women, Statistics Canada, 1997 Catalogue no. 13-217-XIB.

Finnie, R. and T. Wannell (1999). 'The Evolution of the Gender Earnings Gap Amongst Canadian University Graduates', mimeo, School of Policy Studies at Queen's University.

Gunderson, Morley (1998). *Women and the Canadian Labour Market: Transition Towards the Future*. Statistics Canada, Census Monograph Series, Catalogue Number 96-321-MPE No. 2.

Gunderson, Morley and Craig Riddell (1993). *Labour Market Economics: Theory, Evidence and Policy in Canada.* Toronto: McGraw Hill.

Marshall, K. (1999). *Perspectives on Labour and Income*, Statistics Canada, Catalogue no. 75-001-XPE.

Murphy, K. and F. Welch (1990). 'Empirical Age-Earnings Profiles', Journal of Labour Economics, Vol. 8 (2), pp. 202-289.

Wannell, T. (1989). 'The Persistent Gap: Exploring the Earnings Differential Between Recent Male and Female Post-secondary Graduates', *Analytical Studies Branch Research Paper Series*, No. 26, Statistics Canada.

Wannell, T. and N. Caron (1994). 'The Gender Earnings Gap Among Recent Post-secondary Graduates', *Analytical Studies Branch Research Paper Series*, No. 68, Statistics Canada.

Appendix 1: Notes on econometrics techniques

This paper uses slightly different econometric techniques than other studies on gender wage gaps. Both female and male observations are used to estimate the following regression:

(1)

$$\ln w_i = \alpha_m + \alpha_f female + \beta_m X_i + \beta_f X_i female + u_i$$

where w is the hourly wage for individual i; α is the intercept term; X is a vector of human capital and other wage-determining characteristics; β are a vector of estimated regression coefficients showing the return of each characteristic; m denotes males and f denotes females; female = 1 if individual is a female and 0 otherwise.

The coefficient α_f attached to the dummy variable female is the *differential intercept coefficient* - it indicates by how much the value of the intercept term for women differs from the intercept term for men.

The coefficient β_f is the *differential slope coefficient* – it indicates by how much the slope coefficient of men's wage equation differs from the slope coefficient of women's wage equation.

Assuming that $E(u_i) = 0$, from equation (1) individual regressions for men and women may be derived:

(2)

Men

$$E(Y_i \mid female = 0, X_m) = \alpha_m + \beta_m X_m$$

(3)

Women

$$E(Y_i \mid female = 1, X_{fi}) = \alpha_m + \alpha_f + (\beta_m + \beta_f) X_{fi}$$

Simple t tests can be used to test a hypothesis on an *individual* coefficient. For instance, a t test can be used to test the hypothesis whether the differential intercept term is significantly different from the male intercept term. For differential slope coefficients, the t test can tell us whether the female returns to a characteristic is significantly different from the male returns.

The advantage of this approach is that it allows us to pinpoint the source(s) of the difference in male and female wage equations – for instance, differences due to intercept only (parallel regressions), slope (concurrent regressions) or both slope and intercept (dissimilar regressions).

An F test is used to test a hypothesis on a *set* of coefficients. That is, the F test is used to test whether a set of slope coefficients are zero simultaneously. For instance, suppose we want to test whether all the female differential slope coefficients are equal to zero simultaneously. The t test may tell is that an individual coefficient is not significantly different from zero but it does not mean that ALL slope coefficients are not significantly different from zero. Oftentimes it is tempting to throw into the model a number of variables that may have some explanatory power. The F test is also useful to test whether or not to include a variable in the regression model.

Technical notes on Decomposition

Multivariate techniques allow the effects of a number of variables to be analyzed simultaneously. This section describes a how multivariate technique known as decomposition is used to analyze wage differentials between men and women. The dependent variable is the log of hourly wage rates. Each coefficient is the percentage change in hourly wage rates associated with a one-unit change in each explanatory variable.

We use the Oaxaca (1973) method of decomposition. Using equations 2 and 3, it can be shown that the average wage differential between men and women can be decomposed into two components:

$$\overline{W}_m - \overline{W}_f = (\overline{X}_m - \overline{X}_f)\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}_f$$

where $(\overline{X}_m - \overline{X}_f)\hat{\beta}_m$ is the difference in the wage-determining characteristics evaluated at the male pay structure (explained component) and $(\hat{\beta}_m - \hat{\beta}_f)\overline{X}_f$ is the difference in the returns to these characteristics as well as to differences in the constant term (unexplained component).

TABLES

Table 1: Canadian evidence on the gender earnings differential: Results

Author / Publication date	Data	Year	Measure of Earnings	Female:Male Earnings Ratio			Results (logs)*		
				Overall	after controlling for differences in characteristics only	returns only	Raw log Gender Gap	Explained	Unexplained
				=exp(-(A+B)	=exp(-B)	=exp(-A)	A+B	A (Xm-Xf)*Bm	B (Bm-Bf)*Xf
Gunderson (1998)	Census	1970	annual	0.626	0.739	0.846	0.469	0.166	0.302
							100%	35.4%	64.4%
		1980	annual	0.668	0.765	0.874	0.403	0.135	0.268
							100%	33.5%	66.5%
		1990	annual	0.721	0.795	0.908	0.326	0.096	0.23
							100%	29.4%	70.6%
		1990	weekly	0.616	0.773	0.796	0.485	0.228	0.257
							100%	47.0%	53.0%
Baker et al. (1995)	Census	1970	annual	0.602	0.688	0.875	0.508	0.134	0.375
							100%	26.4%	73.8%
		1980	annual	0.644	0.725	0.889	0.439	0.118	0.321
							100%	26.9%	73.1%
		1985	annual	0.656	0.727	0.900	0.422	0.103	0.317
							100%	24.4%	75.1%
	SCF	1986	annual	0.643	0.705	0.912	0.441	0.092	0.349
							100%	20.9%	79.1%
		1991	annual	0.669	0.715	0.938	0.402	0.066	0.338
							100%	16.4%	84.1%
	Census	70/80		refer to text for calculation of of change in the			-0.07	0.01	-0.08
				earnings gap between two periods			100.0%	-14.3%	114.3%
	Census	80/85					-0.017	-0.011	-0.006
							100.0%	64.7%	35.3%
	SCF	85/90					-0.039	-0.003	-0.033
									84.6%
Coish & Hale (95)	SLID	1993	hourly	0.779	0.803	0.97	0.25	0.03	0.220
							100%	12.0%	88.0%
Christofides & Swidinsky (94)	LMAS	1989	hourly	0.762	0.82	0.931	0.271	0.072	0.199
							(100%)	26.6%	73.4%

Note: * To convert the reported differences in mean log earnings to ratios of female to male earnings, calculate ratio = exp (- difference). For instance, in the Baker et al. paper, the ratio of female to male earnings increases from 0.60 to 0.66 between 1970 - 1985.

LMAS: Labour Market Activity Survey; SLID: Survey of Labour and Income Dynamics; SCF: Survey of Consumer Finances; NGS: National Graduate Survey

These studies decompose the average wage differential between females and males into two components: differences in the average wage-determining characteristics (Xm-Xf) evaluated according to the male returns Bm (Explained) and differences in the pay men and women receive (Bm-Bf) evaluated at the female endowments Xf.

Table 2: Earnings ratios based on data from the Survey of Consumer Finances, 1997

Characteristics	FYFT workers			Other workers			All earners		
	Men	Women	Earnings ratio	Men	Women	Earnings Ratios	Men	Women	Earnings Ratio
Overall	$ 42,626	$ 30,915	72.5%	$ 13,821	$ 10,870	78.6%	$ 33,185	$ 21,167	63.8%
Age									
15-24	na	na	80.8	na	na	na	na	na	na
25-34	37,810	28,833	76.3	16,368	12,139	74.2	31,701	21,786	68.7
35-44	44,819	32,916	73.4	19,321	13,436	69.5	39,828	25,262	63.4
44-54	47,957	33,452	69.8	20,917	13,688	65.4	43,228	26,385	61.0
55-64	45,578	29,017	63.7	18,953	12,873	67.9	37,566	20,540	54.7
Education									
Less than high school	30,731	21,403	69.6	12,641	8,476	67.1	23,109	14,107	61.0
Some high school	35,367	22,846	64.6	10,251	6,638	64.8	23,096	12,292	53.2
High school graduate	37,705	27,525	73.0	14,179	10,570	74.5	30,796	19,551	63.5
Some post secondary	37,812	28,360	75.0	10,052	8,263	82.2	24,298	16,405	67.5
Completed post secondary	41,868	29,539	70.6	16,465	12,710	77.2	35,197	21,990	62.5
University	57,930	42,661	73.6	20,821	16,689	80.2	50,099	33,344	66.6
Marital status									
Single	33,451	30,720	91.8	8,927	7,842	0.9	19,591	16,208	82.7
Married	45,102	30,424	67.5	19,407	12,263	0.6	39,494	22,383	56.7
Other	42,300	33,950	80.3	17,699	13,792	0.8	35,334	26,367	74.6
Region									
Atlantic provinces	36,549	25,928	70.9	11,735	7,838	66.8	25,215	15,797	62.6
Quebec	39,100	29,209	74.7	14,521	10,927	75.2	31,018	20,401	65.8
Ontario	45,841	33,494	73.1	13,105	10,833	82.7	36,101	23,274	64.5
Prairie provinces	40,534	27,415	67.6	13,170	10,830	82.2	31,953	18,908	59.2
British Columbia	45,050	32,849	72.9	16,720	12,791	76.5	34,876	22,417	64.3
Job Tenure									
Less than 1 year	36,231	26,715	73.7	12,410	8,975	72.3	22,175	14,064	63.4
1-5 years	37,543	27,443	73.1	15,670	12,202	77.9	32,505	21,088	64.9
6-10 years	43,480	31,641	72.8	19,380	16,318	84.2	40,886	27,462	67.2
11 - 20 years	47,190	34,230	72.5	31,147	18,734	60.1	46,039	30,269	65.7
20+ years	48,720	36,414	74.7	26,573	18,639	70.1	47,225	33,035	70.0

Source: Survey of Consumer Finances, 1997, Statistics Canada, Catalogue 13-217-XIB, Text Table 1, Tables 2, 4, 6, 7, 9
Note: na not available

Table 3: Gender differences in work history, 1997

	Men		Women
Average age	39.2		39.0
Average number of years of schooling	13.6		13.8
Average number of potential years of work experience (= age - years of schooling - 6)	19.5		19.1
Average number of years of full-year, full-time work experience (FYFTE)	18.3		14.4
Proportion of potential years of work experience spent working FYFTE	93.8%		75.4%
Female:male ratio in FYFTE work experience (average FYFTE women / average FYFTE men)		78.7%	
Average job tenure with present employer (in years)	9.7		8.4
Proportion of hours worked part-time	2.7%		13.8%
Among hours worked part-time, percent citing			
... reason for part-time work is family-related responsibilities	..		17.5%
... voluntarily employed part-time	61.9%		62.3%
Number of observations	14,604		13,699

Source: Survey of Labour and Income Dynamics, 1997

Note: The sample used in this table is restricted to paid workers, aged 18-64, not enrolled in school full-time, and with known hourly wage rates, FYFT experience and number of years of schooling. The number of observations are 28,303.

.. Number too small to report.

Table 4: Gender differences in work reponsibilities, 1997

	Proportion of work hours		Hourly wage rate		
	Men	Women	Men	Women	Ratio
Responsible for budget or staffing	21.7	15.7	$ 23.21	$ 18.76	80.8%
Not a supervisor	64.3	74.9	17.29	14.30	82.7%
Supervisor and	35.2	24.8	21.62	17.58	81.3%
... influence pay / promotion OR decide work for others	14.1	11.6	20.48	16.84	82.2%
... influence pay / promotion AND decide work for others	16.1	9.2	23.41	19.32	82.5%
... NEITHER influence pay / promotion NOR decide work for others	5.0	4.0	19.18	15.84	82.6%

Source: Survey of Labour and Income Dynamics, 1997

Table 5: Gender differentials in education level and major field of study, 1997

	All workers: Hourly wage rates			Percentage distribution		Gender Composition	
	Men	Women	Ratio	Men	Women	Men	Women
Overall	$ 18.84	$ 15.12	80.3%	100.0	100.0	57.0	43.0
Education and major field of study							
Less than high school	15.49	10.71	69.1	17.2	11.7	66.1	33.9
High School	16.64	13.04	78.4	17.9	19.7	54.6	45.4
Incomplete post secondary	17.20	13.85	80.5	13.4	11.8	60.0	40.0
Post secondary diploma or certificate	***19.13***	***15.19***	***79.4***	***33.9***	***38.1***	***54.1***	***45.9***
Education, recreational counselling	17.08	14.65	85.8	0.6	3.2	21.1	78.9
Fine and applied arts	16.43	12.61	76.7	1.0	2.7	35.9	64.1
Humanities and related fields	17.41	14.95	85.9	1.0	1.8	45.7	54.3
Social science and related fields	17.89	14.45	80.8	1.4	2.0	49.1	50.9
Commerce management and bus. admin.	19.56	14.80	75.7	5.1	13.8	31.3	68.7
Agricultural, biological science	14.44	12.97	89.8	1.4	1.3	61.4	38.6
Engineering and applied science trades	19.75	15.65	79.2	19.8	2.5	91.3	8.7
Health professions, science and technology	18.05	17.67	97.9	0.9	8.0	13.7	86.3
Mathematics	21.97	16.28	74.1	1.0	1.0	53.4	46.6
No specialization	17.41	13.80	79.3	1.2	1.9	45.9	54.1
University - bachelor degree	***24.34***	***20.57***	***84.5***	***13.0***	***15.4***	***52.8***	***47.2***
Education, recreational counselling	22.36	19.98	89.4	1.4	3.6	33.5	66.5
Fine and applied arts	..	19.11	na	..	0.4	33.6	66.4
Humanities and related fields	23.19	20.01	86.3	1.3	2.3	42.2	57.8
Social science and related fields	22.66	20.31	89.6	2.2	2.8	50.0	50.0
Commerce management and bus. admin.	24.91	21.29	85.5	2.9	2.1	60.4	39.6
Agricultural, biological science	22.68	18.08	79.7	0.5	0.7	45.5	54.5
Engineering and applied science trades	26.84	..	na	2.4	..	92.7	7.3
Health professions, science and technology	na	24.05	na	..	1.3	21.8	78.2
Mathematics	24.80	22.23	89.6	1.7	0.8	69.3	30.7
No specialization	..	..	na	..	..	..	..
Greater than university bachelor degree	***27.77***	***22.55***	***81.2***	***4.1***	***2.9***	***54.5***	***45.5***
Education, recreational counselling	27.37	23.35	85.3	0.5	0.5	40.6	59.4
Fine and applied arts	..	..	na	..	..	..	..
Humanities and related fields	21.27	18.32	86.1	..	0.6	..	..
Social science and related fields	26.81	26.69	99.6	0.8	0.5	69.1	30.9
Commerce management and bus. admin.	29.06	..	na	0.9	..	...	..
Agricultural, biological science	31.27	..	na	..	..	...	..
Engineering and applied science trades	25.66	..	na	0.5	..	...	..
Health professions, science and technology	33.38	23.84	71.4	..	..	...	..
Mathematics	32.21	..	na	0.5	..	...	..

Source: Survey of Labour and Income Dynamcis, 1997

Note: .. Number too small to report

... number supressed for confidentiality reasons

Table 6: Gender differentials in raw average compensation by demographic characteristics, 1997

Characteristic	All workers: Hourly wage rates			FYFT workers: Annual Earnnings		
	Men	Women	Ratio	Men	Women	Ratio
Overall	$ 18.83	$ 15.12	80.3%	$ 46,108	$ 31,506	68.3%
Age group						
17-24	11.00	9.36	85.1	22,749	17,178	75.5
25-34	16.71	14.39	86.1	40,527	28,617	70.6
35-44	20.25	16.38	80.9	47,730	34,414	72.1
45-54	21.68	16.34	75.4	54,449	34,566	63.5
55-64	19.66	14.22	72.3	49,232	28,988	58.9
Marital status						
Married or common-law	20.09	15.45	76.9	49,629	31,736	63.9
Single, never married	14.53	14.00	96.4	32,986	30,432	92.3
Other	18.67	15.14	81.1	42,499	31,959	75.2
Age of youngest family member						
No children / or children 19+	17.83	15.16	85.0	43,259	32,161	74.3
0-4 years	19.49	15.55	79.8	47,052	29,382	62.4
5-9 years	19.97	15.38	77.0	50,206	32,799	65.3
10-14 years	20.21	15.04	74.4	50,477	31,654	62.7
15-19 years	19.28	14.22	73.8	46,596	30,048	64.5
FYFT work experience						
0-2 years	11.28	10.77	95.5	21,892	20,504	93.7
3-5 years	14.33	12.47	87.0	32,234	24,967	77.5
6-9 years	16.38	13.96	85.2	37,280	27,551	73.9
10-19 years	19.32	15.87	82.1	46,749	32,492	69.5
20-29 years	21.19	17.36	81.9	52,604	36,116	68.7
30-39 years	21.30	16.67	78.3	53,098	35,191	66.3
40+ years	17.92	15.39	85.9	41,248	31,935	77.4
Region						
Atlantic	15.51	12.58	81.1	37,422	26,855	71.8
Quebec	18.07	14.53	80.4	41,887	28,414	67.8
Ontario	20.00	16.23	81.2	50,808	35,076	69.0
Prairies	16.66	13.24	79.5	40,857	27,037	66.2
Alberta	18.77	14.33	76.3	47,375	30,727	64.9
British Columbia	19.92	16.00	80.3	46,077	31,884	69.2
CMA and urban size class						
Rural	17.62	14.09	80.0	41,577	29,886	71.9
Less than 25,000	18.00	14.04	78.0	44,364	28,764	64.8
25,000 - 99,999	18.79	14.50	77.2	44,280	29,188	65.9
100,000 - 249,999	19.58	15.05	76.9	47,066	31,791	67.5
250,000 - 999,999	19.20	15.36	80.0	46,528	32,047	68.9
Montreal	19.14	14.79	77.3	44,788	29,212	65.2
Toronto	20.31	17.21	84.7	56,595	37,652	66.5
Vancouver	19.59	16.90	86.3	45,483	34,106	75.0
Number of observations	14839	13902	28741	9020	6667	15687

Source: Survey of Labour and Income Dynamics, 1997

Table 7: Gender pay differentials by various work-related characteristics, 1997

Characteristic	All workers: Hourly wage rates			FYFT workers: Annual Earnnings		
	Men	Women	Ratio	Men	Women	Ratio
Overall	$ 18.84	$ 15.12	80.3%	$ 46,108	$ 31,506	68.3%
Industry						
Agriculture/Fishing	12.44	9.65	77.6	28,687	19,217	67.0
Forestry/mining	21.31	20.00	93.9	56,420	47,556	84.3
Construction	18.38	13.45	73.2	40,686	28,310	69.6
Manufacturing	19.13	13.92	72.8	47,290	30,124	63.7
Business services	18.70	17.24	92.2	46,555	35,559	76.4
Distributive services	21.92	15.62	71.3	62,098	32,626	52.5
Consumer services	13.81	10.27	74.4	33,449	21,699	64.9
Public services	21.64	17.97	83.0	46,825	35,398	75.6
Status						
Full-time	18.94	15.32	80.9	-	-	-
Part-time	15.02	13.87	92.3	-	-	-
Union						
Covered by CBA / union member	20.63	17.86	86.6	46,276	35,229	76.1
Not unionized	17.80	13.61	76.5	46,036	29,217	63.5
Job tenure						
Less than 1 year	14.17	11.22	79.2	33,824	24,438	72.3
1 - 5 years	16.37	13.16	80.4	39,395	26,733	67.9
6-10 years	19.00	15.71	82.7	43,793	31,303	71.5
11-19 years	21.54	17.49	81.2	50,211	35,343	70.4
20+ years	22.92	18.99	82.9	56,984	38,574	67.7
Occupation						
Professional / managers	23.94	18.89	78.9	65,088	39,404	60.5
Natural or social science	23.72	19.70	83.1	52,041	39,727	76.3
Clerical	15.41	13.36	86.7	33,884	26,680	78.7
Sales	17.85	11.86	66.4	48,581	25,909	53.3
Services	14.74	10.03	68.0	34,279	20,419	59.6
Primary, processing, machinery	17.34	11.43	65.9	41,967	24,812	59.1
Construction	18.43	12.82	69.6	40,296	29,608	73.5
Other	16.84	14.60	86.7	39,572	30,168	76.2
Firm size						
Less than 20 employees	14.46	11.99	82.9	32,261	24,723	76.6
20 - 99 employees	17.11	13.97	81.6	41,623	28,674	68.9
100-499 employees	19.55	15.77	80.7	49,273	32,017	65.0
500 + employees	21.55	17.08	79.3	52,164	35,313	67.7
Number of observations	14,839	13,902	28741	9,020	6,667	15687

Source: Survey of Labour and Income Dynamics, 1997

Table 8: Decomposition of the gender earnings differential

	Unadjusted Differential (in logs)	**Explained** (differences due to wage-determining factors) =(Xm-Xf)Bm	**Unexplained** (differences due to returns to wage-determining factors) =(Bm-Bf)Xf	**Adjusted differential** =exp(-(Bm-Bf)Xf)
	(1)	(2)	(3)	(4)
Specification (1)	0.221	0.047	0.173	84.1%
Specification (2)	0.221	0.068	0.153	85.8%
Specification (3)	0.221	0.081	0.140	86.9%
Specification (4)	0.221	0.109	0.112	89.4%

Note: Adjusted differential refers to the female's earnings as a percentage of male earnings after controlling for differences in observable characteristics. To convert our reported differences in mean log earnings to ratios of female to male earnings the following calculation is performed: ratio = exp(-unexplained). For example, female average earnings are about 84.1% of the male ratio after for accounting for differences in FYFTE work experience, major field of study, tenure, marital status and age of youngest family member (Specification 1).

Table 9: Accounting for the gender wage gap, 1997

	Fraction of gender wage gap explained by ...			
	Specification			
Factors explaining the gap	**1**	**2**	**3**	**4**
Education level*major field of study	3.2	4.8	5.8	4.5
FYFTE experience	11.5	11.5	10.4	10.1
Tenure	5.0	3.1	2.9	2.8
Age of youngest family member	0.9	0.7	0.7	0.7
Marital status	1.0	0.7	0.8	0.8
Part-time status		8.5	7.1	3.6
Region		0.0	0.0	0.0
CMA / urban size		-0.3	-0.3	-0.6
Union status		0.6	0.9	0.8
Firm size		1.1	1.1	0.9
Duties			5.3	4.3
Influence budget and staffing decisions			2.1	1.3
Industry				11.2
Occupation				8.6
Total explained	21.6	30.7	36.8	49.0
Total unexplained	78.4	69.3	63.2	51.0
Total	100.0	100	100	100

Appendix 1 Table 1: Results of hypothesis testing on sets of female coefficients

Female differential coefficient	Test used	Specification 1	2	3	4
Intercept	t	1%	1%	1%	1%
FYFT experience	t	1%	5%	1%	NS
Major field of study*educ level	f	1%	1%	1%	1%
Job tenure	f	1%	1%	1%	10%
Age of youngest family member	f	1%	1%	1%	5%
Marital status	f	1%	1%	1%	1%
Part-time status	t		1%	1%	1%
Region	f		1%	1%	1%
CMA / urban size class	f		1%	1%	1%
Union status	t		1%	1%	NS
Firm size	f		1%	1%	1%
Influence budget/staffing	t			5%	5%
Duties	f			5%	NS
Industy	f				1%
Occupation	f				1%

Note: Null hypothesis: Is the differential coefficient for women significantly different from the coefficient for men?

Appendix 2, Table 2: Regression results: significant female interactions (5% level of significance)
Dependent variable: Log hourly wage rates

	Specification number			
	1	2	3	4
Positive interactions	*job tenure-all*	*job tenure-all*	*job tenure-all*	*job tenure-all*
	Some post secondary	*Some post secondary*	*Some post secondary*	*Some post secondary*
	FYFTE experience	FYFTE experience	FYFTE experience	
	Major field of study			
	C - Education / Recreation	C - Education / Recreation	C - Education / Recreation	
				C - Fine Arts
	C- Social Science	C- Social Science		
	C - Agriculture / Biology	C - Agriculture / Biology	C - Agriculture / Biology	
	C- Health	C- Health	C- Health	C- Health
	U - Education	U - Education	U - Education	
	U- Humanities	U- Humanities	U- Humanities	
	U- Social Science	*U- Social Science*	*U- Social Science*	*U- Social Science*
	U- Commerce	U- Commerce	U- Commerce	
	U - Health			
	GU- Education / Recreation	*GU- Education / Recreation*	*GU- Education / Recreation*	*GU- Education / Recreation*
	GU-Fine Arts			
	GU - Humanities	*GU - Humanities*	*GU - Humanities*	*GU - Humanities*
	GU- Social Science	*GU- Social Science*	*GU- Social Science*	*GU- Social Science*
	GU - Commerce	GU - Commerce	GU - Commerce	
	GU - Engineering		GU - Engineering	
		part-time	*part-time*	*part-time*
		small firms	*small firms*	*small firms*
		Atlantic region	Atlantic region	
		Toronto	*Toronto*	*Toronto*
		Vancouver	*Vancouver*	*Vancouver*
		unionized	unionized	
			Budget / staffing decisions	
				Industry:
				agriculture
				forestry / mining
				manufacturing
				business services
				public services
				distributive services
				Occupation:
				clerical
				natural / social science

Negative interactions	Specification number			
	1	2	3	4
	Intercept	*Intercept*	*Intercept*	*Intercept*
	Less than high school	*Less than high school*	*Less than high school*	*Less than high school*
	Married	*Married*	*Married*	*Married*
	Separated/Divorced/Widow			
		Age of youngest:0-4		Age of youngest:0-4
		Age of youngest:5-9		
	Age of youngest: 10-14	*Age of youngest: 10-14*	*Age of youngest: 10-14*	*Age of youngest: 10-14*
	Age of youngest: 15-19	*Age of youngest: 15-19*	*Age of youngest: 15-19*	*Age of youngest: 15-19*
	Major field of study			
		C - Mathematics		C - Mathematics
				C-Social science
				GU-Agriculture
				GU - Health
	No specialization	*No specialization*	*No specialization*	*No specialization*
		Prairies	*Prairies*	*Prairies*
		CMA / urban <250,000	CMA / urban <250,000	
				Sales / Services occupations
			Supervisor - 1 duty	

Note: Positive (negative) interactions denote characteristics for which women are paid relatively better (worse) than men. Characteristics in italics are interactions that are siginificant at the 5% level for all specifications.